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PATENT SPECIFICATION



Application Date: Aug. 12, 1939. No. 23337/39.

534,772

Complete Specification Left: May 29, 1940.

Complete Specification Accepted: March 18, 1941.

PROVISIONAL SPECIFICATION

Improvements in and relating to Pipe Couplings

We, PARNALL AIRCRAFT LIMITED, a company registered according to the Laws of Great Britain, of 18, Essex Street, Strand, W.C.2, in the County of London,

5 THEO SHERWEN, a British subject, of Corner House, The Ridge, Chipping Sodbury, in the County of Gloucester, and DOUGLAS HERBERT SCOTT LONSDALE, a British subject, of The Lawns, Yate, in 10 the County of Gloucester, do hereby declare the nature of this invention to be as follows:—

This invention relates to pipe couplings of the kind in which for securing a grip 15 on the walls of a pipe or tube a deformable tubular element or sleeve is subjected to circumferential compression by the axial movement of an outer containing sleeve which is normally arranged in 20 screw-threaded engagement with a correspondingly internally screw-threaded element which may for instance be a nipple or socket element secured to a pipe or forming part of a device to or from 25 which the passage of fluid is to be effected.

Pipe couplings of this kind as hitherto produced, present two disadvantages, one due to the fact that the pressure exerted 30 on the tubular element or sleeve is limited only by the force exerted on it by the displacement of the outer tubular element so that the effectiveness of the mechanical connection and also the 35 effectiveness of the fluid connection depends on the judgment of the assembler, so that if the force exerted be too great the pipe which is to be gripped by the deformable tubular element or 40 sleeve may be distorted by the pressure exerted.

Further, the longitudinal force due to 45 fluid pressure in the pipe system, of which the connection forms part, is taken up solely by the deformable sleeve so that if the pressure in the pipe system is of an intermittent or fluctuating character creep of the joint may occur.

Further, generally speaking, known 50 pipe couplings of the type in question have not been capable of standing up to high pressures.

The object of the invention is to pro-
[Price 1/-]

vide an improved pipe coupling of the kind referred to which shall not exhibit 55 the disadvantages above referred to and shall be capable of withstanding high fluid pressures and at the same time can be easily assembled or dismantled without the necessity of forming a screw-thread, flange or flare on the tube or effecting welding, soldering, brazing or similar operations.

According to the invention the deformable tubular element or sleeve is 65 formed or provided with means for limiting firstly the axial compression of a jointing ring and secondly the radial compression of the pipe thus preventing excessive compression stresses being set 70 up while providing a rigid grip on the pipe to take the mechanical stress.

Thus, in accordance with the invention, the deformable tubular element or sleeve may be formed at one end with an 75 element adapted to abut against a seating provided in the nipple or socket element and at the opposite end with a tapered portion furnished with a plurality of radial slits or gaps to permit the 80 deformation of this portion of the sleeve under the action of circumferential compression which is effected by the axial displacement of an outer containing sleeve formed internally with a correspondingly tapered or conically formed surface.

Preferably, in accordance with the 85 invention, with the deformable tubular element or sleeve there is associated a spigot element adapted to effect the compression of a jointing ring engaged in the nipple or socket element and thus 90 permit the formation of a fluid-tight joint.

Conveniently, this spigot element is 95 formed integrally with the deformable tubular element or sleeve or it may however be a separate ring adapted to seat against the end thereof.

Preferably, in accordance with the 100 invention, the nipple or socket element is furnished with a seating against which the end of the tube engaged therein will bear.

In one construction in accordance with

the invention the pipe coupling comprises a nipple or socket element in which is provided a shoulder or seating for one end of the length of tube or pipe 5 to be engaged by the coupling, and a further shoulder or seating for a jointing ring or washer engaged about the wall of the pipe, the internal diameter of the nipple or socket element at this portion 10 being greater than the internal diameter of the portion thereof which provides a seating for the end of the pipe.

A further seating or shoulder is provided against which a circumferential 15 flange provided on the deformable tubular element will bear.

As above indicated, the deformable tubular element or sleeve is provided adjacent to one end, that is the end 20 remote from the flange in question, with a conically formed or tapered portion in which a plurality of radial slits are provided, such slits being so dimensioned in respect of their width that they permit 25 the desired degree of deformation under circumferential compression to be effected, but prevent excessive compression.

Such circumferential compression is 30 secured in this construction by the provision of an externally screw-threaded outer containing sleeve which is internally provided with a correspondingly tapered or conically formed surface and 35 is designed to be engaged in an internally

screw-threaded portion of the nipple or socket element.

The jointing ring employed may be shaped or chamfered to permit easy insertion into the appropriate portion of 40 the nipple or socket element, the method of assembly being first the outer containing sleeve, second the deformable tubular element or sleeve and lastly the jointing ring. 45

The end of the tube is then inserted into the nipple or socket element until its end seats upon the shoulder provided therein. The outer containing sleeve is then displaced axially with respect to the 50 tube until the screw-thread thereon is engaged with the internally screw-threaded portion of the nipple or socket element. Relative rotation of these two elements is then continued until the 55 circumferential flange on the deformable tubular element bears against the seating or shoulder provided in the nipple or socket compressing the jointing ring the predetermined amount, further relative 60 rotation closing the slits in the said element and gripping the pipe or tube. When the slits in the element are closed further compression of the pipe is not 65 possible and excessive deformation is prevented. The thinnest gauge tubing may thus be safely employed.

Dated this 12th day of August, 1939.
MARKS & CLERK.

COMPLETE SPECIFICATION

Improvements in and relating to Pipe Couplings

We, PARNALL AIRCRAFT LIMITED, a company registered according to the Laws 70 of Great Britain, of 18, Essex Street, Strand, W.C.2, in the County of London, THEO SHEWES, a British subject, of Corner House, The Ridge, Chipping Sodbury, in the County of Gloucester, 75 and DOUGLAS HERBERT SCOTT LONSDALE, a British subject, of The Lawns, Yate, in the County of Gloucester, do hereby declare the nature of this invention and in what manner the same is to be performed, to i.e. particularly described and ascertained in and by the following statement:—

This invention relates to pipe couplings of the kind in which for securing a grip 85 on the walls of a pipe or tube a deformable tubular element or sleeve is subjected to circumferential compression by the axial movement of an outer containing sleeve which is normally arranged in 90 screw-threaded engagement with a correspondingly screw-threaded element which

may, for instance, be a nipple or socket element secured to a pipe or forming part of a device to or from which the passage of fluid is to be effected. 95

In certain pipe couplings of this kind, the deformable tubular element or sleeve is furnished with a plurality of radial slits or gaps and is formed so that it is initially, or may, as the result of axial 100 movement of the outer containing sleeve, be rendered conical, the portion of the tubular element or sleeve remote from such portion constituting a spigot which enters a recess in the nipple or socket element, and co-operates in compressing a body of jointing material or packing.

In one such construction, the spigot portion in question is screw-threaded to engage a corresponding screw-thread in the recess in the nipple or socket element, a flange being furnished in order to limit its axial movement.

In this construction, however, there has been provided no seating for the end 110

or the pipe or tube but in the other construction a seating has been provided for the end of the pipe or tube, the device in this case being intended for joining 5 flexible metallic tubing to gas or other fittings.

The object of the present invention is to provide an improved pipe coupling of the kind referred to in which the deformable tubular element or sleeve is furnished with a plurality of radial slits or gaps in a portion of its length while the other portion of its length is furnished with a spigot element adapted to enter a recess in the nipple or socket element and a flange adapted to provide an abutment in limiting the degree to which it may be displaced in tightening up the pipe coupling.

According to the invention, the deformable tubular element or sleeve is provided with radial slits or gaps which are so dimensioned as to prevent excessive compression stresses being set up in the pipe, while providing a rigid grip on the pipe to take the mechanical stress and the spigot portion thereof is arranged to give a sliding fit in the recess, so that in tightening up the coupling it will effect the compression of a jointing ring.

Conveniently, this spigot element is formed integrally with the deformable tubular element or sleeve or it may, however, be a separate ring adapted to seat 35 against the end thereof.

Preferably, in accordance with the invention, the nipple or socket element is furnished with a seating against which the end of the tube engaged therein will 40 bear.

The invention will be described further in detail and by way of example with reference to the accompanying drawings, in which:—

Figure 1 is a view in sectional elevation, and

Figure 2 is a view in end elevation of a pipe coupling in accordance with the invention;

Figure 3 being a view in elevation of one of the elements thereof.

In the drawings, 1 is a deformable sleeve which is furnished with a plurality of longitudinal slits 2 formed at one end 55 with an enlargement 3 adapted to abut against the seating 4 provided in the socket element 5 and at the opposite end with a tapered portion 6 furnished with a plurality of radial slits or gaps to permit deformation of this portion of the sleeve under the action of circumferential compression which is effected by the axial displacement of an outer sleeve constituted by the gland nut 7 engaged in 60 the screw-threaded portion 8 of the socket

element and provided internally at the position indicated by the reinforcement 9 with a tapered or conically formed surface corresponding with the external tapered surface of the deformable 70 sleeve.

The extremity of the deformable sleeve is provided with a portion 10 which functions as a spigot element adapted to effect the compression of a jointing ring 75 11 engaged in the nipple or socket element and thus permit the formation of a fluid-tight joint.

In the construction illustrated, this spigot element is formed integrally with the deformable tubular element or sleeve but as pointed out above it may be constituted by a separate element.

For providing an abutment for the end of the tube 12 in the socket element 5 there is furnished a shoulder 13.

The method of assembly is to pass the end of the tube through the gland nut 7 then through the deformable sleeve 1 after which the jointing ring 11 is engaged on the spigot portion 10 of the deformable sleeve. The end of the tube is then inserted in the socket element until its end seats upon the shoulder provided therein. The gland nut is then displaced axially with respect to the tube until the screw-thread therein is engaged with the internally screw-threaded portion of the socket element. Relative rotation of these two elements is then 90 continued until the circumferential flange on the deformable tubular element bears against the seating or shoulder provided in the nipple or socket compressing the jointing ring the predetermined amount, further relative rotation closing the slits in the said element and gripping the pipe or tube. When the slits in the element are closed further compression of the pipe is not possible 100 and excessive deformation is prevented. The device may thus be safely employed with the thinnest gauge tubing.

A construction in accordance with the invention performs two functions, that 115 is, the provision of an hydraulic seal and a mechanical fixing of the pipe in the coupling, and these functions are secured independently one of the other and thus more efficiently than would be possible if 120 the operation of fixing the pipe in the coupling in itself operated to provide an hydraulic seal. Furthermore, the sealing washer is not permanently deformed and thus the joint can be stripped and 125 re-assembled repeatedly using the same sealing washer.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to 130

be performed, we declare that what we claim is:—

1. Pipe couplings of the kind specified in which the deformable tubular element or sleeve is provided with radial slits or gaps which are so dimensioned as to prevent excessive compression stresses being set up in the pipe, while providing a rigid grip on the pipe to take the mechanical stress and the spigot portion thereof is arranged to give a sliding fit in the recess, so that in tightening up the coupling it will effect the compression of a jointing ring.
2. A pipe coupling as claimed in Claim 1 in which the spigot element is formed integrally with the deformable tubular element or sleeve.
3. A pipe coupling as claimed in either of the preceding claims in which the nipple or socket element is furnished with a seating against which the end of the tube engaged therein will bear.
4. Pipe couplings substantially as hereinbefore described and as illustrated in and by the accompanying drawings.

Dated this 29th day of May, 1940.
MARKS & CLERK.

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534.772 COMPLETE SPECIFICATION

1 SHEET

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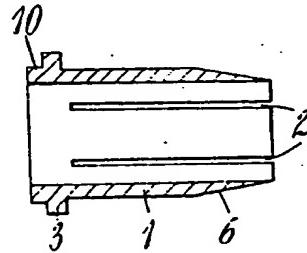
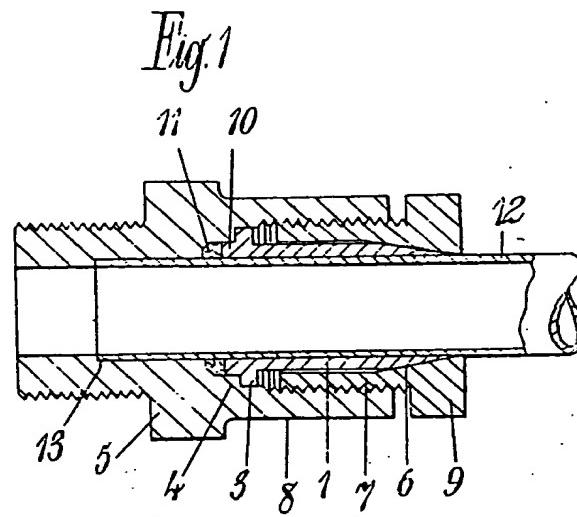
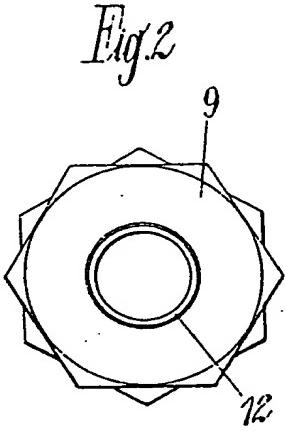


Fig. 3